II. AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1 (original):   A method of designing a vehicle air system comprising:

using a computer to simulate operation of a proposed vehicle air system over a time period, said proposed vehicle air system comprising an air compressor and a pneumatically operable device;

using said computer to calculate a duty cycle of said air compressor over said time period;

using said computer to output said duty cycle.

2 (original):   The method as set forth in claim 1, further comprising:

using said computer to compare said duty cycle to a predefined threshold; and,

if said duty cycle exceeds said threshold, recommending modifications to said proposed vehicle air system.

3 (original):   The method as set forth in claim 1, wherein said time period is equal to an average period of time that said proposed vehicle air system is expected to be operated per day.

4 (original):   The method as set forth in claim 1, wherein said step of simulating operation of a proposed vehicle air system over a time period includes:

simulating selective operation of said air compressor to add air to said proposed vehicle air system; and,

simulating selective operation of said pneumatically operable device to exhaust air from said proposed vehicle air system.

5 (original):   The method as set forth in claim 4, further comprising:

inputting vehicle use information that describes expected operation conditions of said proposed vehicle air system over said time period, wherein said step of simulating selective operation of said pneumatically operable device to exhaust air from said proposed vehicle air

system includes simulating operation of said pneumatically operable device at intervals that vary depending upon said input vehicle use information.

6 (original):   The method as set forth in claim 5, wherein said pneumatically operable device comprises a pneumatic suspension, and wherein said vehicle use information includes expected road roughness information.

7 (original):   The method as set forth in claim 5, wherein said pneumatically operable device comprises a pneumatic brake system, and said vehicle use information includes brake application pressure information.

8 (original):   The method as set forth in claim 5, wherein said pneumatically operable device comprises a pneumatic windshield wiper system, and wherein said vehicle information comprises climate wetness information.

9 (original):   A method for predicting performance of a vehicle air system comprising:

inputting into a computer data that simulate a proposed vehicle air system, including: (i) data that describe a simulated air compressor of the proposed vehicle air system; and, (ii) data that describe a simulated pneumatically operable device of said proposed vehicle air system;

using said computer to simulate operation of said proposed vehicle air system over a simulation time period, said simulation operation including: (i) selectively simulating exhaustion of air from said proposed vehicle air system in response to simulated operation of said pneumatically operable device; and, (ii) selectively simulating addition of air to said proposed vehicle air system in response to simulated operation of said air compressor; and,

outputting data from said computer that describe said simulated operation of said proposed vehicle air system.

10 (original): The method as set forth in claim 9, wherein said step of outputting data comprises:

calculating a duty cycle that represents a percentage of said simulation time period that simulated operation of said air compressor to is carried out to simulate addition of air to said proposed vehicle air system;

outputting said duty cycle.

11 (original): The method as set forth in claim 10, further comprising:

comparing said duty cycle to a predefined threshold; and,

recommending modification of said proposed vehicle air system if said duty cycle exceeds said threshold.

12 (original): The method as set forth in claim 10, wherein said step of inputting data that simulate a proposed vehicle air system includes inputting data that describe a plurality of simulated pneumatically operable devices of said proposed vehicle air system, and wherein said step of using said computer to simulate operation of said proposed vehicle air system over a simulation time period includes selectively simulating exhaustion of air from said proposed vehicle air system in response to simulated operation of said plurality of pneumatically operable devices, said method further comprising:

determining a total amount of air exhausted from said vehicle air system during said simulation time period;

determining the percentage of the total amount of air exhausted attributable to each of said plurality of pneumatically operable devices;

for each of said plurality of pneumatically operable devices, displaying the percentage of the total amount of air exhausted attributable to that device.

13 (original): The method as set forth in claim 9, wherein said step of inputting data further comprises:

(iii)   inputting data that describe a simulated air dryer of said proposed vehicle air system.

14 (original): The method as set forth in claim 13, wherein said step (ii) of inputting data that describe a simulated pneumatically operable device comprises:

inputting data that describe at least one of: a simulated air leak; a simulated pneumatic suspension; a simulated pneumatic kneeling apparatus; a simulated pneumatic windshield wiper system; a simulated pneumatic door system; a simulated pneumatic seat; and a simulated pneumatic gear shift apparatus.

15 (original): The method as set forth in claim 9, wherein said step (ii) of inputting data that describe a simulate pneumatically operable device comprises:

inputting data that describe the amount of air used by said pneumatically operable device; and,

inputting data that describe the volume from which said pneumatically operable device receives air for operation.

16 (original): The method as set forth in claim 9, further comprising:

inputting data that describe proposed use of a vehicle on which said proposed vehicle air system is to be used.

17 (original): The method as set forth in claim 16, where in said step of inputting data that describe proposed use of said vehicle comprises:

inputting data that describe at least one of: road surface roughness encountered by said vehicle; a number of stops per day of use of said vehicle; a number of parking brake applications per day of use of said vehicle; environmental wetness conditions encountered by said vehicle; a number of gear shifts performed by said vehicle; a number of door open/close cycles performed by said vehicle; and, a number of kneel cycles performed by said vehicle.

18 (original): A method for predicting vehicle air system performance comprising:

inputting data that describe a proposed vehicle air system including at least an air compressor and at least one pneumatically operable device;

receiving input data related to a capacity of the proposed air compressor to supply air to the proposed vehicle air system;

receiving input data related to a cut-in pressure of said proposed vehicle air system below which said proposed compressor is considered operative to add air to said proposed vehicle air system;

receiving input data related to a cut-out pressure of said proposed vehicle air system above which operation of said proposed compressor to add air to said proposed vehicle air system is considered terminated;

receiving input data related to a usage rate at which said at least one pneumatically operable device depletes air from said proposed vehicle air system when said pneumatically operable device is considered to be in use;

receiving input data related to a frequency of operation of said pneumatically operable device;

determining a period of operation for the proposed vehicle air system;

simulating operation of said proposed vehicle air system over said period of operation by: (i) calculating data that represent air depleted from said proposed vehicle air system based upon the usage rate and frequency of operation of said at least one pneumatically operable device; and, (ii) calculating data that represent air added to said proposed vehicle air system by said proposed air compressor based upon the cut-in and cut-out pressures;

recording data that represent a duration of time of said period of operation that said air compressor is considering to be adding air to said proposed vehicle air system; and,

calculating data that describe a duty cycle of said proposed air compressor, said duty cycle related to a percentage of time said compressor is considered to be operated during said period of operation.

19 (original): The method as set forth in claim 18, wherein said step of receiving input data related to a frequency of operation of said pneumatically operable device comprises receiving at least one of climate information and road roughness information.

20 (original): The method as set forth in claim 18, wherein said at least one pneumatically operable device is a brake system, and said step of receiving input data related to a frequency of operation of said pneumatically operable device comprises receiving information related to a frequency of break applications.